REMARKS

Please reconsider the application in view of the above amendments and the following remarks.

Status of Claims

Claims 1, 3-13, 15-17, 19, 20 and 22-32 are rejected. Claims 1, 20, and 27 have been amended to provide clarification. Claims 13, 15-17 and 19 have been cancelled without prejudice. Claims 1, 3-12, 20 and 22-32 are currently pending.

Drawing Objections

The drawings are objected to under 37 CFR 1.83(a) as not showing every feature of the invention specified in the claims. Applicants respectfully traverse this objection.

FIG. 1 shows spans (labeled Span 1, Span 2,…Span n-1, Span n). Applicants submit that the loss characteristics (e.g., high loss and low loss) per se cannot be illustrated and the low loss spans and high loss spans could be anywhere in a multi-span optical communication system. To provide clarification, however, applicants have amended the specification to read: "Dispersion may thus be allowed to accumulate over long spans (e.g., Span 1 and Span 2) but may be compensated on the occurrence of a relatively low loss span (e.g., Span n-1)."

Accordingly, applicants submit that the drawings show every feature of the claimed invention pursuant to 37 CFR 1.83(a) and request that this objection be withdrawn.

Claims Rejections – 35 USC § 102

Claims 1, 12, and 31 are rejected under 35 USC 102(e) as being anticipated by U.S. Patent No.6,324,317 to Tanaka et al. ("Tanaka '317"). Claims 1, 12, and 31 are also rejected

under 35 USC 102(e) as being anticipated by U.S. Patent No. 6,188,823 to Ma ("Ma"). Applicants respectfully traverse these rejections and request reconsideration.

Independent claim 1 recites a method of compensating for chromatic dispersion comprising identifying a plurality of non-periodically spaced low loss spans in the transmission path and compensating for accumulated dispersion using a dispersion compensating fibers directly coupled to an associated one of the low loss spans. As described in the present application on page 5, lines 3-19, compensating for dispersion following a low loss span enables the amount of power launched into the dispersion compensation fiber to be minimized, thereby optimizing performance of the optical amplifier. Moreover, allowing dispersion to accumulate over several spans reduces the cost and complexity of the system.

Tanaka '317 fails to disclose such a method for dispersion compensation as recited in independent claim 1. In particular, Tanaka '317 does not disclose identifying non-periodically spaced low loss spans and dispersion compensation in low loss spans. The Office Action asserts that the single mode fibers (SMF) 4a in Tanaka '317 are high loss spans and asserts that the reversed dispersion fibers (RMF) 4b are low loss spans. Applicants respectfully point out that these fibers 4a, 4b, alone, are not spans; but the fibers 4a, 4b together form spans, which are referred to as an inter-repeater segments 4_1, 4_2,... 4_n in Tanaka '317 (col. 12, lines 13-35). As used in the present application, a "span" extends between optical components (e.g., between two amplifiers, between a transmitter and receiver without amplifiers, or between a transmitter/receiver and an amplifier). See present specification, p. 4, ll. 10-17. Applicants have amended independent claim 1 to clarify "span" by explicitly reciting that at least some of the high loss spans and low loss spans extend from one optical amplifier to another optical amplifier.

In the system of Tanaka '317, neither the fiber 4a, nor the fiber 4b, extends from one optical amplifier to another optical amplifier. Moreover, the dispersion compensation fiber (DCF) 4c is not "directly coupled" to a low loss span. Even if the inter-repeater segment or span including fibers 4a, 4b were disclosed as a low loss span, the DCF 4c is not directly coupled to that span because the DCF 4c appears in the next span.

Similarly, Ma fails to disclose such a method for dispersion compensation as recited in independent claim 1. The Office Action refers to positive dispersion slope fibers 404 in Ma as high loss spans and negative dispersion slope fibers 402 as low loss spans. Applicant respectfully points out that these fibers 402, 404 alone, are not spans; but the fibers 402, 404 together form a span between optical amplifiers 43. In fact, Ma states "[t]he exemplary embodiment of the invention in FIG. 4 shows (N+1) spans (i.e., paths between two adjacent optical amplifiers)" (col. 3, lines 45-47). The fibers 402, 404 are merely constituent fibers within these disclosed spans (col. 3, lines 49-51). Moreover, Ma fails to disclose that the dispersion compensating fiber 405 is "directly coupled to" a low loss span. Even if the span including fibers 402, 404 was disclosed as a low loss span, the fiber 405 is not directly coupled to that span because the fiber 405 appears in the next span.

For these reasons, Applicants respectfully submit that neither Tanaka '317, nor Ma, anticipate independent claim 1 or the claims dependent therefrom. Because none of the amended independent claims are anticipated by Tanaka '317 or Ma, Applicants respectfully request that the rejections under 35 USC 102 be withdrawn.

Claims Rejections – 35 USC § 103

Claims 3-5 are rejected under 35 USC 103 as being unpatentable over Tanaka '317 in view of U.S. Patent No. 6,681,082 to Tanaka et al. (Tanaka '082). Claims 6, 7, 9, 20 and 25-29 are rejected under 35 USC 103 as being unpatentable over Tanaka '317 in view of U.S. Patent No. 6,417,961 to Sun et al. ("Sun"). Claims 11, 13, 16, 17 and 24 are rejected under 35 USC 103 as being unpatentable over Tanaka '317 in view of Sun and further in view of U.S. Patent No. 6,366,728 to Way ("Way"). Claims 8, 10, 22 and 23 are rejected under 35 USC 103 as being unpatentable over Tanaka '317 in view of Sun and further in view of U.S. Patent No. 6,466,362 to Friedrich ("Freidrich"). Claims 15 and 19 are rejected under 35 USC 103 as being unpatentable over Tanaka '317 and Sun in view of Way and further in view of Friedrich. Claims 30 and 32 are rejected under 35 USC 103 as being unpatentable over Tanaka '317. Applicants also respectfully traverse these rejections.

Dependent claims 3-12 and 30 all depend from claim 1. Amended independent claim 27 recites an optical communication system comprising a Raman/EDFA amplifier including at least one dispersion compensating fiber coupled to a low loss span such that the optical communication system is configured to allow dispersion to accumulate in high loss spans and to compensate for dispersion in the low loss span(s). Applicants submit that dependent claims 3-12 and 30 and independent claim 27 (and claims 28, 29 and 32 dependent from claim 27) are patentable for the reasons stated above in connection with claim 1. Specifically, Tanaka '317 fails to disclose or suggest dispersion compensation in low loss spans while allowing dispersion to accumulate in high loss spans. Thus, even if Tanaka '317 were combined with one of the

other cited references, as proposed in the Office Action, the combination fails to teach or suggest all of the claimed limitations.

With respect to independent claim 20, applicants submit that none of the cited references, alone or combined, teach or suggest allowing chromatic dispersion to accumulate over a group of plurality of spans of to a first predetermined level before non-periodically compensating for the accumulated dispersion with a dispersion compensating fiber between a Raman portion and an EDFA portion of a Raman/EDFA. The Office Action asserts that Sun teaches compensating fibers (DCF) 28 disposed between a Raman portion 36 and an EDFA portion 34. Although the Sun patent discloses a system including spans 16 and amplifiers 18 (see Fig. 1 of Sun), all of the optical amplifiers 18 provide dispersion compensation instead of allowing dispersion to accumulate over several spans. If the teaching of Sun were combined with the teaching of Tanaka '317, the resulting optical communication system would, at best, include one of the optical amplifiers of Sun following each of the inter-repeater segments of Tanaka '317. Such a modification would likely substantially change the dispersion map of the system of Tanaka '317 and would thus render the system of Tanaka '317 unsatisfactory for its intended purpose. See MPEP 2143.01. Thus, neither Sun, nor Tanaka '317, suggests the desirability of making this combination.

Moreover, even if the references were combined, the resulting system would not perform a method comprising "non-periodically compensating for accumulated dispersion," as recited in amended independent claim 20. Both Tanaka '317 and Ma appear to disclose dispersion compensation that is periodic or occurs at regular intervals, as illustrated in the dispersion maps shown in FIGS. 12A, 12B, 13A, and 13B of Tanaka '317 and in FIGS. 5 and 6 of Ma. In

contrast, non-periodic dispersion compensation results, for example, when the dispersion is allowed to accumulate over several spans and the dispersion compensation is allocated only to relatively low-loss spans, which allows the cost and complexity of the system to be reduced, as described in the present specification on page 5, lines 3-19.

For these reasons, applicant submits that independent claims 20 and 27, and all claims dependent therefrom, would not have been obvious. Accordingly, Applicant requests that the rejection of claims 20, 22-30 and 32 under 35 USC 103 be withdrawn. Because claims 13, 15-17 and 19 have been cancelled without prejudice, applicant requests that the rejection of these claims be withdrawn.

The claims have been shown to be allowable over the prior art. Applicant believes that this paper is responsive to each and every ground of rejection cited by the Examiner in the Office Action dated December 28, 2005, and respectfully requests favorable action in this application. The Examiner is invited to telephone the undersigned, Applicant's attorney of record, to facilitate advancement of the present application.

Please apply any charges not covered, or any credits, to Deposit Account No. 50-2121 (Ref. No. 1020).

RESPECTFULLY SUBMITTED,

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